



# APRIL '84

## I-M 1 IN A MILLION CLUB

### NATIONAL NEWSLETTER

#### INSIDE...

LOW RES ART CONTEST!  
G & A FOLLOW UP  
FEATURE SPOTLIGHT  
MORE HELPFUL HINTS  
THREE SHORT PROGRAMS  
FOUR PRODUCT REVIEWS  
MOVING ALONG IN 'THE ARCADE'  
TUNES FROM LOUIS SOULET



**GRO-GRAFX LIMITED**

P.O. Box 54 • Amherstburg, Ontario N1T 2Z2

EDITOR-GEORGE RAKER  
PRODUCED MONTHLY BY-GRO-GRAFX LTD.  
PRINTED BY-GLENN VOSS PRINTING

BULK RATE  
U.S. POSTAGE  
PAID  
Ste. 200, 111 W. Adams  
Chicago, IL 60606  
Permit No. 298

High quality merchandise for the APF home computer...

[REVISED] APF BASIC LANGUAGE REFERENCE MANUAL

Do you ever get tired of trying to translate the mistakes APF Electronics made when writing the APF Basic Language Reference Manual? Well, now there is an alternative, the new (Revised) APF Basic Language Reference Manual. The most complete manual available for the APF home computer! It includes everything the original manual contained (excluding the mistakes) except for high resolution graphics. Also, there are three special reference charts in the back. Such as a screen map chart and a shape/color chart. Please note that this is not a teaching manual, but merely for reference!

The all new (Revised) APF Basic Language Reference Manual -- what every APF home computer user needs.

For only \$4.50  
(including shipping)

STAR CASTLE

You've seen it in the arcades and now you can have it for your APF home computer. A high speed game which requires an extremely lucky player. You are in command of a small space ship with a mission to destroy the star castle. Fire as much as you like, but good luck getting past the protective wall, and look out for the castle's laser gun. This 8K program comes with detailed instructions.

For only \$7.50  
(including shipping)

THE FOLLOWING PROGRAMS ARE NOW ON SALE FOR \$1.50 EACH.

Chopper Interceptor-Attempt to shoot down helicopters.

\*Turbo-Dodge on coming cars.

\*Alien Defender-Similar to popular arcade game named "Defender".

Asteroids-Dodge on coming asteroids.

\*Frogger-Similar to the popular arcade game.

Alpine Skiing-Dodge on coming trees.

Sailing-Sail your boat between three sets of pylons in a race against time.

\*Baja-Dodge on coming baja racers.

Space Shuttle-Pilot the space shuttle Columbia.

\*Sky Diver-Jump from a plane and parachute down to the ground.

- \* Programs with stars before the title will not be available after May 5, 1984.
- Each game comes with instructions.

... Please add \$1.50 shipping charges, per program.

SEND CHECK OR MONEY ORDER TO: Eddie Bednar  
71804 Brookwood Rd.  
Austin, Texas 78750

# GENERAL NEWS

## MORE CLUB PROGRAMS HAVE ARRIVED!

Shortly after the MARCH issue went to print we received several NEW programs for the CLUB LIBRARY. These programs were submitted by HARRY BROWN and LOUIS DOOLEY and will be included in the CLUB LIBRARY ADDENDUM that will appear in a later issue. Thanks to Harry and Louis for sending them in!

----

## CORRECTION TIME

Although we try very hard to eliminate any errors in the newsletter before the master is sent to the printshop, a few have slipped by.

Aside from a number of TYPOs, the following important corrections should be made:

1. JANUARY-Q & A-Question by VINCE JOHNSON. Line 100 in the BASIC program should have read: 100PRINTI,:NEXT

2. FEBRUARY-HELPFUL HINTS-Routine by CHUCK GLANCY. Line 80 in the SCORING SECTION should have read:

80PRINT"SCORE= ";A1" SCORE= ";B

Some copies were corrected by hand before they were mailed. NOTE: This routine has been reported as troublesome and does not work when used with other HI RES programs. It's purpose was to provide a DISPLAY and as far as we can determine, was not intended to be incorporated in other games without modifications. No mods were provided with the program. If anyone would like to suggest how this routine can be used, we invite you to send in your suggestions.

3. HARRY BROWN also sent along improvements to the ARITHMETIC PRACTICE program that appeared in the FEBRUARY issue. For those of you who would like a hardcopy of these improvements, please write.

----

## JUDGES NEEDED!!

This issue contains information about the 1984 IM-1 IS A MILLION LO RES FRONT SCREEN ART CONTEST.

We are in need of THREE JUDGES to evaluate and score each entry. If you would be interested in becoming a judge for this contest and have a working IM-1 with a COLOR TV, we'd sure appreciate hearing from you! Please let us know if you are interested IMMEDIATELY. If there are more than three applicants, names will be drawn.

## NEW MANUAL NOW AVAILABLE!

EDDIE BEDNAR has sent in a copy of his new BASIC LANGUAGE REFERENCE MANUAL that is now available to order.

Much of the information was taken from the original APP version and has been printed on standard 8½ X 11 paper with wide margins for insertion in a binder.

The manual contains 16 pages of useful information with topics such as: KEYBOARD, GENERAL INFORMATION, COMMANDS, PROGRAM STATEMENTS, ARITHMETIC FUNCTIONS, STRING FUNCTIONS, MUSIC, LOW RES GRAPHICS, TAPE SYSTEM, SCREEN MAP CHART, SHAPE/COLOR CHART, and FILE INFORMATION.

The manual would be useful to beginner programmers, to those who need a new manual to replace their SHOP WORN originals copies, or for those who bought their machines used and never got the original manual with it.

## INFORMATION DRIVE!

One very important function of this newsletter is to provide information to the membership mainly by PASSING ALONG any information that we receive FROM other members.

We should emphasize the word ANY. What one member might find uninteresting, another may find VERY USEFUL. The distinction of what may or may not be useful MUST lie with the individual member. Our job is to keep the data flowing!

## WE CAN'T DO IT WITHOUT YOU!

It would be all too easy to paste up lins after line of BASIC PROGRAMS every month in order to fill the many pages that exist in every issue. This would be intolerable to most members, and is something that we WILL AVOID at all cost!

Therefore we are asking each of you to HELP THE CLUB OUT by sending in ANY information that you feel would be helpful to other club members. If you doubt that the information can be used, put those doubts aside long enough to get the information IN THE MAIL. We'll ALL appreciate it, especially those members who can really use it, and, wouldn't it be rewarding to KNOW that YOU HELPED!

## PLEASE--GIVE IT A TRY!

# Spotlight

"My name is Bill Lunquist. Many of you are using a program I wrote called ROMMON. I also had a part in writing many other programs which are currently being sold for the APP."

"My personal APP 1M-1 probably doesn't look alot like yours. I have expanded the computer to 16K memory inside the keyboard. I have built a b/w monitor output board on to the game unit and replaced the socket that holds ROMMON with a ZIF (zero insertion force) socket so that I can easily change and test ROMMON chips. These two changes did not leave enough room for the game's top cover so I also added a larger heat sink to keep the power supply voltage regulator cooler."

"My building block only has one stock APP cartridge. I use the FI-100 disk interface. I have a custom tape board which allows me to read and write Kansas City Standard tapes using any tape recorder. I have another board which uses memory from \$7800-\$7FFF (BASIC expansion) for the software to ram any block of memory from and to the built in tape (my own custom APP tape format). The final board on the building block is a parallel printer driver."

"My personal ROMMON is quite different from the commercial version. It will not work without being connected to the keyboard (The MP-1000 cannot play games by itself). However, my ROMMON will work without the BASIC cartridge. If the BASIC cartridge is in place, the computer will go into BASIC and display only the cursor. If BASIC is not in place, the computer will go into ROMMON's monitor. If a game cartridge is installed, "PLAY!" will be displayed on the screen. If you press "Y", the game will play normally. If you press "N", the computer will go into ROMMON's monitor. I removed "SOCKET PATROL" from my copy to make room for these changes."

"There are many other changes to my ROMMON but I'd like to also tell you a little about what I am doing with the BASIC cartridge. I have modified my BASIC so that I can plug in programmable chips (EPROMS). I started by correcting minor annoyances such as the sound not shutting off after tape save and load, and the disk drive running all of the time. My latest change should be of interest to almost all APP users. I now have software adjustable keyboard de-bounce. Both ROMMON and BASIC use a memory location to determine the amount of de-bounce. If I start getting multiple characters on the screen, I just POKE a higher value to the de-bounce location and everything is fine."

"I have modified the keyboard driver in many ways. If you press the break key, you go to ROMMON's monitor (much easier than "CALL18450"). The keyboard does upper/lower case. Lower case is displayed as reverse alpha. This mod is also supported by ROMMON's editor. Un-shifted characters are upper case and shifted characters are lower case. Since this is backwards, I modified the printer driver so that if a memory location flag is set, the upper/lower case is reversed as it is printed so that it comes out correctly on paper."

"BASIC'S maximum line length is normally 128 characters. If you go beyond that number, you lose the whole line. I changed the length to 224 characters. If you try to make the line longer than that, the additional letters are refused but the line is not lost. The EDIT command is no longer in my basic since editing is done by ROMMON. If you list only one line from BASIC, that line is displayed by ROMMON and can be instantly edited by pressing the "E" key."

"I have made far too many changes to cover in this letter. So far, I haven't come up with an easy way to make these improvements available to other APP owners. I can supply the chips quite reasonably, but I cannot (will not) hardwire BASIC cartridges to use the chips."

"The changes I have made to my APP have allowed me to modify some great programs to run on the machine. I am using a two pass assembler and line oriented editor which have been used on programs as long as 2,500 lines. If you have any questions about any of the things that I am doing with my APP, please write or call before 9 P.M. EASTERN. Bill Lunquist, 3739 Wentworth S.W., Wyoming, MI 49509, (616) 534-6201."

# HELPFUL HINTS

---

**FROM MARK SPITZERMAN**

"I would like to submit a HELPFUL HINT for ASSEMBLY LANGUAGE programmers. The BLOCK MOVE that is outlined in the TECHNICAL REFERENCE MANUAL will move a MAXIMUM of 255 bytes (Not 256 as stated in the manual). It will move an ENTIRE SECTOR (256 bytes) with the following variation:

Set up the destination (A029/A02A) and SOURCE (A02B/A02C) of the BLOCK MOVE--then clear the "B" accumulator and enter the BLOCK MOVE routine at 7703 instead of 7700. An example in assembly language to move a sector from the disk I/O buffer to A000 is shown below:

```
LDX #$A300      ADDRESS OF DISK I/O BUFFER
STX $A028      SOURCE FOR BLOCK MOVE
LDX #$A000      ADDRESS TO MOVE TO
STX $A029      DESTINATION FOR BLOCK MOVE
CLRB          CLEAR ACCUMULATOR B
JSR $7703      MOVE IT
```

Apparently the people who wrote "ARTIST AND EASEL" were not aware of this because they moved 255 bytes and POKE'd the 256th byte separately when they were block moving the screens in and out of screen memory. I hope this variation will be as useful to others as it is for me."

---

**FROM HARRY BROWN**

"I have a couple of tips on the IM-1, or any other computer for that matter: Plug all cables from the unit into a MULTI-OUTPUT socket, remove during storms, and when not in use. Find the grounded side of the supply plug as well as the receptacle. Mark the plug on grounded side and check when plugging in. This will prevent most static accidents.

If the cassette recorder latch wears and won't retain the lid, repair from exterior by attaching a plastic mirror clip (wrong side up) on the left hand side in front of the lid, just near enough to turn it by hand to open the cassette lid. The left side of the cassette lid tends to ride high and with this simple modification made, the tape will always be in the same alignment."

---

**FROM ERNEST E. SMITH**

"In a previous newsletter you requested information on IM-1 parts. I am not sure that my information is still valid, but about a year ago a surplus electronics firm offered IM-1 joysticks. Here is their name and address:

TECHNICAL ELECTRONICS  
232 W. Cummings Park  
Woburn, MA 01801  
PHONE (617) 935-1717  
IM-1 MP1000 JOYSTICK STOCK# 38-2497  
PRICE WAS \$8.50 EACH

---

Our thanks to MARK, HARRY, and ERNEST for the tips. If you have any tips that you'd like to pass along to others in the club, please send them in!

---

# THE ARCADE

In last month's issue we introduced the terms OF CODE and ADDRESSING MODE along with instructions that covered several methods of loading the A and S accumulator using the various addressing modes. This issue will continue with further methods of using the accumulators. Each new instruction will bring us closer to our goal.

Once again...Instruction from ERIC BECKER.

If you want to load accumulator A with data that is at an address HIGHER than FF, you have to use the next addressing mode which is LOAD ACCUMULATOR A (EXTENDED) or as it sometimes appears in print LDAA EXT., or as HEX B6 according to the actual OF CODE called for by the instruction set summary. This command takes 3 FULL BYTES. The first byte B6 is the actual OF CODE, and the next two bytes contain the address where the data resides that we want to put into the A accumulator. For example, if we went into the MONITOR MODE (CALL ZB672), and, at any particular address saw the following data:

B6  
02  
50

it would simply mean that when the processor reaches this point, it will immediately load accumulator A with whatever data is at address location 0250 (HEX). You can load accumulator B extended the same way using the HEX value of F6 in place of the B6. Using the EXTENDED mode of addressing gives you the ability to load data from any address between 0000 to FFFF (0 to 64,000 decimal), which is EVERY possible location the processor can address.

So far you have learned to load accumulator A and B using THREE addressing modes. There is yet another way! NOTICE THE DIFFERENCE in the following.

LOAD ACCUMULATOR A INDEXED, or as it sometimes appears, LDAA INX, or A6 as it is called for by the instruction set summary. This instruction is 2 BYTES long; the first byte being the OF CODE for this function, and the second byte called the OFFSET byte.

Before we can adequately explain the operation of this command, we must introduce another PART of the processor that

corresponds to this command. It's called the INDEX REGISTER.

The INDEX REGISTER, or as it commonly appears in print (X), is a 16 bit (2 BYTE) register that is primarily used to store a memory address in the INDEXED MODE OF MEMORY ADDRESSING. The INDEX REGISTER may be decremented, incremented and stored. The 6800 contains only ONE INDEX REGISTER. It is separate from the accumulators and operates differently. We'll learn more about it's operation as we progress, but for the present, our only concern will be how it relates to the LOAD ACCUMULATOR A INDEXED command.

The way in which the LDAA INDEXED command works is that the A accumulator will be loaded with data that is located at an address that is IN the INDEX REGISTER, PLUS the offset byte (Second byte in the command as mentioned earlier).

For example, in this mode of addressing, the NUMBER (Offset) found in the 2nd byte of the instruction is ADDED to the contents of the INDEX REGISTER to form a new and different EFFECTIVE ADDRESS. The new effective address is the location in memory which contains data for the operation or is the DESTINATION for data.

This new effective address is held in a temporary address register such as ACCUMULATOR A so the contents of the INDEX register is not destroyed or altered. Let's assume that the index register contains an address of 0520 (HEX). By using the LDAA INX command, the processor will load accumulator A with the number 0520 plus the offset byte.

Another way of this explaining this is, if the processor comes across an address that contains the OF CODE of A6 (LDAA INX), it would know that it is going to ADD the next hex value it comes across to 0520 and put this new value into A ACCUMULATOR, so if immediately following our value of 0520 the HEX value of 20 appeared (OFFSET BYTE), it would ADD this value to the index register value and place the results in A accumulator thus producing our NEW EFFECTIVE ADDRESS of 0540.

The OFFSET BYTE can be any number between 00 and FF.

NEXT MONTH—STORING THE CONTENTS OF THE ACCUMULATOR TO THE SCREEN! SEE YOU THEN!

# SHORT PROGRAMS

These short programs were taken from the club PROGRAM LIBRARY. The program on the left side of the page is to be used for SORTING names alphabetically. The program, top right, displays the conversion from HEXADECIMAL to DECIMAL. Very useful when involved in machine language programming. The program, bottom right displays the conversion from gallons to liters and vice versa.

Please write and let us know what TYPES of programs YOU are interested in seeing in the newsletter. If there are a few in the PROGRAM LIBRARY that you would like to see printed, let us know which ones they are so that we can reserve space for them in future issues.

```
1 POK 24576:001:0IN R1(1):0RD 10
2 0IN R1(1)
3 0IN RULL(C2D)
4 FOR I=0 TO 20:NULH(I)="
5 CALL 17846:POKE 40966,I,9
6 0IN R1(1):0RD
7 0IN R1(2):0RD
8 FOR I=0 TO 20:NULH(I)=I+NULH
9 CALL 17846
10 0IN R1(1):0RD
11 0IN R1(2):0RD
12 FOR I=0 TO 20:NULH(I)=I+NULH
13 CALL 17846
14 0IN R1(1):0RD
15 PRINT : PRINT : PRINT
16 PRINT : PRINT : PRINT "S O R T   R U N N I N G"
17 PRINT : PRINT "ENTER NAMES---999 TO EXIT"
18 0IN R1(1):0RD
19 0IN R1(2):0RD
20 IF A8C(C2D)=""999" THEN 0=0:1: GOTO 20H
21 GOTO 0H
22 CALL 17846: POKE 40966,2: PRINT : PRINT : PRINT "WAIT PLEASE"
23 FOR I=0 TO 6-I
24 FOR K=1+I TO I
25 IF R1(I)+R1(K)>R1(I)+R1(K) THEN R1(I)+R1(K)=R1(I)+R1(K)+R1(I)+R1(K)+R1(I)+R1(K)
26 NEXT K
27 NEXT I
28 FOR I=1 TO 6
29 PRINT R1(I),20H
30 IF I=1 THEN INPUT "TYPE <RTN>":R1
31 NEXT I
32 INPUT "TYPE <RTN> TO QUIT":R1
33 IF R1="" THEN 21H
34 R1(R1=""/R1(1))=":1: GOTO 5
35 PRINT : PRINT "SORT COMPLETED": PRINT : PRINT "
36 PRINT : PRINT : END
```

```
2 POK 24576:001:0IN R1(1):0RD 10
3 CALL 17846:POKE 40966,2:POKE 40961,4: RETURN
40 COSUB 2: PRINT "R E X   T O   D E C"
42 BASE=4#H%
43 PRINT "ENTER HEX":T
45 IF HEX(T)="" THEN 15
46 R1(1)=HEX(T)
47 PRINT R1(1):1H
48 FOR I=0 TO 15
49 IF R1(I)>=40H THEN 50:H=4-H:GOTO 50
50 IF H>=40H THEN 51:H=4-H:GOTO 51
51 T=H-GHORSE1
52 BASE=BASE/16
53 IF BASE<1 THEN BASE=4#H:GOTO 15
54 GOTO 15
55 PRINT "":S
56 PRINT DEC+S
57 PRINT : PRINT "PRESS RTN"
58 IF HEX(R1(1))="" THEN 15H
59 IF HEX(R1(1))="" THEN 15H
60 COSUB 3
61 T#H
62 T#H
63 GOTO 14
```

  

```
5 REM MODE BY MANUEL MUNIZ RIBAS
6 REM APRIL 21 1981
7 CALL 17846
8 PRINT : PRINT : PRINT
16 PRINT "THIS PROGRAM CHANGE GALLONS TO LITER"
17 PRINT "OR LITER TO GALLONS"
18 INPUT "E=1=LITER-2=GALLONS":C
19 IF C=1 GOTO 4H
20 IF C=2 GOTO 2H
21 INPUT "HOW MANY GALLONS":R
22 PRINT "THE CONVERSION ON LITER IS = 10"
23 PRINT USING "###.##",#43.0#;#43.0#
24 GOTO 5H
25 INPUT "HOW MANY LITER":D
26 PRINT "THE CONVERSION IN GALLONS IS = 10"
27 PRINT USING "###.##",#43.0#;#43.0#
28 GOTO 5H
29 INPUT "W CONTINUE - 1 END":E
30 IF E=0 GOTO 7
31 IF E=1 GOTO 4H
32 PRINT : PRINT "
33 GOTO 5H
```

# Q & A

# FOLLOW UP

## FROM THE JANUARY ISSUE

**QUESTION:** By VINCE JOHNSON concerning the use of a comma when producing columns, and how to reset it so that the columns will not appear to be ragged when trying to make 9 or more columns. (An error appeared on LINE 100 in the January issue. The statement should have read:

100 PRINTI,:NEXT

**ANSWER:** Submitted by W.B. LINQUIST, Wyoming Michigan.

"Here is my solution to the problem with using the comma to print long lists of information. After each PRINT statement, POKE41033,0. This resets the APP counter so that it never gets high enough to cause the carriage return and line feed which looks so bad."

"The APP assembly code is:"

```
LDAB FLDCHT This is the counter.  
FIELD2 LDAA #32 Load the A reg. with  
an ASCII space.  
JSR OUTCH Print it.  
INC8 Add one to the counter  
BITB #7 See if we are at  
an even tab location.  
BNE FIELD3 If not, do another apc  
CMPE #71 This is the problem.  
This probably should  
be 63.  
BNE FIELD3 If 8 is greater than  
71, then do carriage  
return.  
STAB FLDCHT Save counter  
BRA PRINTI Skip past the carriage  
return.  
FIELD3 JSR PCREL Print carriage return  
and line feed.  
PRINTI INC----- etc. CONTINUE PRINTING
```

"I have changed the 71 value to 63 on my BASIC cartridge so I don't have the problem any more. I hope this clears up this particular problem."

## FROM THE FEBRUARY ISSUE

**QUESTION:** By DAVE CONWAY & JOHN PIERCE concerning the requirements to change the SI-232 output characteristics so that it can operate fixed printers such as the GORILLA BANANA or RADIO SHACK TR-10.

**ANSWER:** Submitted by MARK SYKESMAN, Eastland Michigan.

"The BASIC cartridge sets the SI-232 to 7 DATA bits, EVEN PARITY, 2 STOP bits.

The ACIA can be programmed for other characteristics (as shown in the lower right corner of page 9 in the SI-232 manual) by POKEing the proper value into the ACIA CONTROL REGISTER. The ACIA CONTROL REGISTER address is \$6400 HEX, or, 25600 DECIMAL. The table below shows the DECIMAL values to be poked into the CONTROL REGISTER for the various available output characteristics:

# OF BITS	DATA BITS	H OF PARITY	DEC. POKE
7	7	EVEN	1
7	7	ODD	5
7	7	EVEN	9
7	7	ODD	13
8	8	NONE	17
8	8	EVEN	21
8	8	ODD	25
8	8	EVEN	29

10 POKE 25600,3: POKE 25600,17

The BASIC line above will issue a MASTER RESET to the ACIA and then set it up for 8 DATA BITS, NO PARITY, and 2 STOP BITS. The assembly language routine for the same set up as the BASIC line above would be:

```
86 03 LDAA #3 RESET  
87 6400 STAA $6400  
86 11 LDAA #$11 HEX FOR DEC 17  
87 6400 STAA $6400 SET UP 8 BITS,NO PARITY  
39 RTS RETURN
```

I have set my QM1DATA printer up for 8 DATA bits with EVEN PARITY, and have been able to print on it using the methods shown above. This method seems to work fine for printing under PROGRAM CONTROL, however, there is still a problem in getting program LISTINGS. This problem exists because every time the computer returns to the IMMEDIATE MODE (Cursor on the screen waiting for the user to type in a command or a BASIC line) the BASIC cartridge RESETS the ACIA to the ORIGINAL SETUP OF 7 DATA bits, EVEN PARITY, and 2 STOP bits. This means that if you type "POKE25600,17" in the IMMEDIATE MODE to change the output characteristics as mentioned above, the computer will change them right back again before the cursor comes back on the screen, making it impossible to get a PROGRAM

# Q & A

# FOLLOW UP

## LISTING in the IMMEDIATE MODE.

There are 2 ways to get around this problem though. One way is to include a BASIC line in your program that will allow you to LIST OUT A PROGRAM. The line shown below will accomplish this:

```
9990PRINT:=1:POKE25600,3:POKE25600,N:LIST
```

Where N is the DECIMAL NUMBER to POKE from the table. Make sure you have an "END" or "STOP" statement in your program prior to this line or you will be getting a LISTING every time you RUN the program. To get a program listing just type in COT09990. After the cursor comes back on the screen type PRINT=0 to turn off the printer flag. (PRINT=0 cannot be included at the end of line 9990 because after a LIST command, the computer always goes to the IMMEDIATE MODE and will not execute it.)

It is not always possible to add a line to a BASIC program such as the example on the other page, without some major difficulty. For example, there may be some data that is protected by an offset END-OF-PROGRAM pointer. Adding a line to the program would probably cause you to lose that precious data. BE NOT DISCOURAGED! There is another way to get your program listed. First, type in the following short program:

```
10POKE=0TO17  
20READY  
30POKEK,Y  
40NEXT  
50DATA134,1,183,161,203,134,3,183,100,0,134  
60DATA17  
70DATA183,100,0,126,140,180
```

This program installs a MACHINE LANGUAGE ROUTINE at memory address 0000 that will allow you to get a listing on your printer. Just RUN this program, then load in the program you wish to LIST to the printer. Next type in CALLS. The printer should list the program. After the cursor comes back on the screen, type PRINT=0 and you will have accomplished your mission!

The program shown above is for 8 DATA bits, NO PARITY. To set up for other output characteristics all you have to do is change line 60 in the program. The DATA in line 60 should be set to the DECIMAL NUMBER to POKE into the CONTROL REGISTER (Found in the table). This program can be saved on disk or tape and can be loaded

and run prior to loading the program you wish to LIST on your printer. This program will stay in memory unless you run a program that uses memory addresses 0000-0011. For this reason it is best to get your listing out (TYPE "CALLS") before you RUN the program."

---

PETER MORANSKI sent in his solution to the preceding question. He writes, "I currently have a GORILLA BANANA CK-100 printer hooked up to my APP. To fix the software they must POKE location 25600,03 which in turn resets the ACIA. Next they must POKE 25600,17 which sets the clock and data format.

The only problem is that you can't use it in the IMMEDIATE MODE. As an example, you cannot reset the ACIA and then try to list a program. You must write up a very short program beforehand to allow you to do this. The program is as follows:

```
1POKE25600,03:POKE25600,17  
2PRINT=1:LIST
```

Enter your program from here on. This will LIST your program to the printer provided it is a part of the program. If you have ROMMON, you can set up the ACIA from the MONITOR, and then use the printer option and it will work fine.

The only thing that I can figure out is that the BASIC interpreter resets the ACIA every time it outputs to the printer in the IMMEDIATE MODE. If anyone would have further questions and would like to contact me, they can call 914-896-5586 between 9 AM and 1 PM E.S.T., TUESDAY THRU SATURDAY, or all day on SUNDAY AND MONDAY. Or they can write to me at:"

35 REVERSE ROAD  
FISHKILL, NY 12524

---

A SPECIAL THANKS to BILL LOWDUNST, MARK SPYKERMAN, and PETER MORANSKI for detailed instructions and examples.



# PRODUCT REVIEW

## BOOK KEEPER

If you're looking for a good bookkeeping program for your IM-1 that is easy to use, JIM CLATFELTER'S BOOK KEEPER program may be just what you need.

This program allows you to do simple bookkeeping chores for home or business. You can enter individual accounts, develop 4 income and 10 expense accounts, and make up to 120 entries per month.

The program is menu-driven and allows for QUICK DATA ENTRY and correction. Your data can easily be saved to either tape or disk, and the program is set up to print the data to an 80 column printer.

For home accounting, the program keeps a record of actual income and expenditures with detailed data for each entry. This makes it more versatile for home budgeting than other budget programs that accept only minimal information about an entry.

For checking and savings accounts simply enter deposits in an INCOME ACCOUNT and checks, bank service charges, and automatic payments in EXPENSE ACCOUNTS. There are endless variations that you can come up with.

I have found this program to be well documented, easy to use, and flexible enough to be used in practically any personal or small business accounting situation.

## SUPER DASHUM

Have you ever experienced the LET DOWN of needing to add a line to your BASIC program after finding that you failed to leave room for additions or expansion? SUPER DASHUM from HEXMART provides you with means to RE-NUMBER your ENTIRE program, or any portion of it, with user defined increments between BASIC line numbers, and starting points.

By itself, the BASIC re-numbering portion of this program would serve to adequately re-number most any BASIC program that exists; however, HEXMART did not stop there! For instance, the referenced line pointers are AUTOMATICALLY UPDATED and will accommodate reference calls such as, GOTO, OSUB, ONOTO, ONODUG, EFTNEN (when line # is specified), and PRINT USING (when line # is used).

The program does not occupy any user RAM whatsoever and can be used to re-number programs in an 8K IM-1, an expanded 16K IM-1, or a 27K IM-2. Assembly (DIAGNOSI) language subroutines written under a "REM" statement are unaffected by this program.

SUPER DASHUM includes 4 ERROR SEEKING CHECKS: 1. If you exceed BASIC line number 9999 when the program is re-numbered, 2. If your starting line (user defined) does not exist, 3. If the re-numbering causes the program to exceed the memory of your system, 4. If the offset pointer would cause SUPER DASHUM to go off into an endless loop. If any of these errors occur, an appropriate ERROR MESSAGE is produced. The program is USER FRIENDLY with easy to understand PEEKS, error checking and mistake recovery features and comes with easy to follow instructions.

## DC-232

With necessity being the mother of invention, and with the scarcity of BUILDING BLOCKS and INTERFACE CARTRIDGES for our computers, INVENTION has become somewhat of a NECESSITY for our IMAGINATION MACHINES! Glenn Jones has developed a very useful SERIAL CART-RIDGE (DC-232) that not only serves as an interface to either PRINTER or MODEN, but also eliminates the requirement for a BUILDING BLOCK (BB-1) to operate these serial devices.

In actuality, the unit is a STANDARD APP SI-232 CART-RIDGE that has been modified with BB-1 circuitry inside, and contains a ribbon cable and connector that plugs into the edge connector reserved for the BB-1 (in the rear of the computer).

For those of you who have been looking for a BB-1 but have not been able to find one, this unit could possibly be the answer to your serial interfacing need. If you would be fortunate enough to obtain a BB-1 at a later date, the DC-232 can then be DE-MODIFIED back to its original state (SI-232) and plugged into one of the slots in the BB-1. This feature eliminates the need to purchase an additional SI-232 at a later date.

We've had the opportunity to check the unit out and have connected it to our ADO5 terminal, SIGNALMAN MARK VIII MODEN, VOLKSMODEN, and our ancient SANGARD T-1D5A. The DC-232 worked well with these devices, with no errors in upper or lower case both to and from the devices, and when running different types of software with it. This unit is a very welcomed addition to the IM-1 interface line.

## AIT-IMPIA

The AIT-IMPIA PARALLEL PORT CARD plugs directly into the BB-1 expansion. It's sixteen parallel bidirectional data lines and four control lines come off the board through a 50 pin edge connector and three feet of flat fifty ribbon cable which is included with the card.

The majority of the card is a MOTOROLA MC6821 PERIPHERAL INTERFACE ADAPTER. The 16 parallel I/O lines which are in two groups of eight (A-side/B-side port) are BIT PROGRAMMABLE as INPUTS or OUTPUTS. The 8 lines on the A-side are pulled up or can drive 1 standard TTL load each, or can accept an input from a standard TTL device. The 8 lines on the B-side are buffered and can easily drive 10 TTL loads. The 4 control lines, also programmable, are used for handshaking with external devices. Half the control lines act as INPUT ONLY whereas the other 2 are BI-DIRECTIONAL. The parallel port is DIRECT MEMORY ACCESSABLE and can be programmed from BASIC with POKEs or examined with PEEKs. The card can be used to control everything from the simple LED's and switches on A.I.T.'s TRAINER BOARD (AIT-IMPIA-ST), which will be reviewed next month, to the fine tuning of your household heating system. A useful addition for IM-1 EXTERNAL CONTROL.



## ORCHESTRA PIT

The following musical scores are excerpts from the most recently submitted program by LOUIS DOOLEY into the PROGRAM LIBRARY. Because of the overall length (2½ pages), a sampling of the program appears here. A MENU exists in the FULL VERSION so that you can make your selection of each individual tune. The name of the program is "IM-1 JUNKBOX" library # D111KEROX. Thank you Louis for the hard work, and for letting us enjoy the tunes.



# Artshop

ANNOUNCING

## THE 1984 LO RES FRONT SCREEN COMPUTER ART CONTEST!

The contest begins NOW! All entries received must be POSTMARKED NO LATER THAN JUNE 10, 1984. Rules: One entry per member. Entry must be submitted ON TAPE and consist of ONE FRONT SCREEN done in LOW RESOLUTION GRAPHICS with ALPHA/NUMERIC CHARACTERS if desired. Any LO RES shape and any COLOR OR CHARACTER can be used.

The picture must appear on screen locations 512 to 1023 (FRONT SCREEN). NO MOVING CHARACTER will be considered in the judging process. ONLY THE FRONT SCREEN WILL BE JUDGED. NO COMMERCIALY PRODUCED FRONT SCREENS WILL BE ALLOWED.

Judging: Each entry will be judged by a THREE MEMBER panel selected by a drawing of all judge applicants (as explained in the GENERAL NEWS). The following point system will be used:

DETAIL AND COMPLEXITY OF THE ARTWORK (1 to 20 points)

COLOR COORDINATION AS IT PERTAINS TO THE OVERALL PICTURE (1 to 15 points)

JUDGES' PREFERENCE (1 to 10 points)

At the conclusion of the contest period, copies of ALL entries will be placed on a single tape and sent to each judge. A scoring sheet will accompany each tape. After the judges have scored each entry, the scores will be returned to us for the final point tally, at which time the GRAND PRIZE WINNER will be determined. Decisions of the judges will be final, and in case of a tie the GRAND PRIZE WINNER will be determined by a drawing. The winner will be notified by telephone at the end of the point tally, or drawing, whichever the case may be.

The decoded WINNING ARTWORK will appear in a future newsletter. This will allow ALL MEMBERS to enter and see the GRAND PRIZE WINNING FRONT SCREEN.

This computer art contest is sponsored by the following producers of software for the IMAGINATION MACHINE. Each has submitted a program to be awarded to the GRAND PRIZE WINNER.

MEEMART SOFTWARE-YOUR CHOICE OF PROGRAM

GLENN JONES-GAME "FREEZE"

JIM CLATFELTER-COMBINATION-BOOK KEEPER/RANT KEEPER

ERIC BUCKETT-GAME PROGRAM

ADRIE BEGNAR-GAME-"STAR CASTLE"

GRAND PRIZE: In addition to the programs listed above, the winner of the 1984 LO RES FRONT SCREEN COMPUTER ART CONTEST will receive:

A BEAUTIFUL WALL PLAQUE CONMEMORATING THE CONTEST AND DEPICTING THE WINNER.

ALL PROGRAMS PRODUCED BY GEOGRAPHIX LIMITED.

CHOICE OF 10 PROGRAMS FROM THE CLOS PROGRAM LIBRARY.

This contest is legal in states that permit their residents to engage in contest activity outside their state boundaries....VOID WHERE PROHIBITED. Note: If you would like your tape returned, please enclose 37¢ postage (stamp) to cover the return postage. Also, be sure to give your front screen a title. Send all entries to:

ART CONTEST  
c/o GEOGRAPHIX LIMITED  
P.O.BOX 66  
ARROWNITH, IL 61722

REMEMBER THE DEADLINE AND.....GOOD LUCK!!!

Greg W. Ching  
121 Emerson St.  
Palo Alto, CA 94301

A senior, double majoring in Electrical Engineering (Computers), and Philosophy (Formal Systems) at Stanford University.  
"I am very interested in working to extend the capabilities of my IM-1, especially in the area of MAIN FRAME communications."

R. Bruce Hocken  
79 Denlin Ave.  
Merritt Island, FL 32953 (305) 452-3015

Space Shuttle Systems Engineer/Programmer at Kennedy Space Center, Florida. President of Space Coast Microcomputer Club and Computers-for-Kids (CKK) project in local school system. Now writing AMF IM-1 educational software for school labs with more than 50 APFs in daily use.

## THE NATIONAL MAILBOX

Steven G. Liberatore  
7 Richard Circle  
Woburn, MA 01801

"I own an IM-1 with dual disk drive, RS232 interface, printer, and a modem. I am an Electrical Engineer at U-MASS and hope to use my machine for more uses other than playing and progressing games."

John Pierce  
1731 N. 157th, #6  
Layton, UT 84041

"Please put my name in the "LONELY COMPUTER" section. I'm an electronics technician with the U.S. AIR FORCE."

Michael Russell  
Box 2084 CS  
Pullman, WA 99163

"Have massive software for the APF. Have expanded the machine to control my outside electrical device. Will help or trade with interested APF owners."

Andrew B. Mead  
2538 Everglade Dr.  
Lake Havasu City, AZ 86403 (602) 855-8963

"I know how to program in BASIC very well. I plan to go to one of the Arizona universities next year. Major: Chem Engineering. I would like to know how to program in other languages."

Dwight E. Morris  
2324 Blaine Dr.  
West Palm Beach, FL 33406

"APF computer, RS232, RS423, Epson Printer, Modem. Interested in flying, ham radio, machine progressing, real estate, gardening, beer!"

Douglas L. Smith  
3952 Persimmon Dr., Apt. T2  
Fairfax, VA 22031

"Have system with 3 disk drives and a printer & modem. Am interested in finding adventure for the DM-1. Am professional computer programmer. Like to trade programs and write programs."

# THE LANGUAGE BARRIER

## READ

Using this statement allows you to actually READ the DATA that is stored within your program in DATA statements. These two commands work hand and hand. The variable list (DATA STATEMENT) denotes which variables are to have values assigned. Variable NAMES in the list are separated by COMMAS. The variable list may include NUMERIC VARIABLES and/or STRING VARIABLES as mentioned in a previous issue of the newsletter.

The computer will read each DATA statement sequentially from left to right and will assign values to the variables in the variable list from left to right. DATA statements are normally read in LINE NUMBER ORDER. Wherever a READ statement is performed in your BASIC program, values for the variables in the variable list are assigned sequentially, using all the items that were in the DATA list of the current DATA statement before going on to the next DATA statement. There is a way to OVERRIDE this sequence using the RESTORE statement.

When RESTORE is used values will be assigned beginning with the FIRST DATA statement in the program. In effect it is resetting the data pointer back to the original starting point.

The following is a short program using the DATA and READ statement without using the RESTORE statement:

```
10 FOR X=1 TO 3  
20 READ X  
30 PRINT X,  
40 NEXT X  
50 DATA 10,20,30
```

Line 10 sets up the X loop for 3 cycles. Line 20 will read the first value from the DATA statement and put this numeric value into the X variable. Line 30 prints this number in a column.

# CLASSIFIED

BUY TAPES IN QUANTITY & SAVE  
HIGH RIAS = BETTER CLARITY!!  
CARTON OF 25 C-60 - \$5 29.45  
CARTON OF 25 C-90 - \$5 38.50  
CARTON OF 50 C-60 - \$5 51.55  
CARTON OF 50 C-90 - \$5 68.70  
CARTON OF 100 C-60 - \$5 85.90  
CARTON OF 100 C-90 - \$5 114.50

Send check or M.O. to:  
Ron Cartman  
136 N. Heron Dr.  
Washington, D.C. 20745

### \*\*\*\*\*PROGRAMS\*\*\*\*\*

BOOK KEEPER....\$11.95  
(An accounting program)  
RENT KEEPER....\$14.95  
(Property management)  
BOOK KEEPER WITH COPY WRITER  
(word processing) AND LABEL  
WRITER (mailing list program)  
AND RENT KEEPER...\$29.95  
JIM CHATFELTER  
646 Corwin Avenue  
Glendale, CA 91206

### \*\*\*\*\*CLASSIFIED ADVERTISING\*\*\*\*\*

SIZES: 3 INCHES WIDE X 2 INCHES HIGH (Rec'd.)  
COST MONTHLY: \$5.00 per box  
TERMS: Submit your ad with your payment,  
typewriter within the borders of a 3  
X 2 box. A MAXIMUM of 2 boxes is allowed  
for each member monthly. For larger space,  
send for ADVERTISERS RATE SHEET. Have  
your ad to us AT LEAST 1 month in advance!

Line 40 sends the program back to the preceding READ statement until the FOR NEXT statement has been completed; 3 loops. We end up with three columns containing 10, 20, and 30.

Now, insert 25 RESTORE. Run the program again and you will find that 3 columns of the same number (10) have been printed, hence the RESTORE statement resets the pointer during each loop.

\* \* \* HARDWARE \* \* \*

**DC-232 SERIAL INTERFACE**

NO BUILDING BLOCK REQUIRED! Allows the connection of a printer, modem, or other serial device to your IM-1. Includes a FREE copy of the LINE PROCESSING SYSTEM, an upper case, pseudo word processing program.....\$44.95  
DC-232 & RS-232 cable.....\$59.95

**SI-232 SERIAL INTERFACE**

New, with APP manual.....\$14.95  
SI-232 & RS-232 cable.....\$29.95

**RS-232 CABLE**

Please include DIN connections for your printer, or specify standard cable.....\$19.95

ALL ORDERS WHICH INCLUDE ONE OR MORE OF THE ABOVE ITEMS  
MUST INCLUDE \$5.00 FOR SHIPPING AND HANDLING.

**16K INTERNAL MEMORY KIT**

This perfect compliment to the DC-232 eliminates the need for the RS-K RAM by expanding your computer's memory to 16K internally. Comes complete with parts and instructions....\$24.95

**24K MEMORY INSTRUCTIONS**

Requires BUILDING BLOCK & RS-K RAM; comes with detailed instructions, illustrations, & schematics only.....\$14.95

\* \* \* SOFTWARE \* \* \*

**FERZERX**

Absolutely one of the best, most professional arcade games available for the IM-1! 100% machine language means the action DOES NOT STOP for sound effects, as in most other games. Similar to Atari's BERZERK arcade game (8K).....\$9.95

**STAR TREX**

Still an all-time favorite of arcade-lovers & intellectuals alike. Strategy with graphics and lots of excitement. Consists of 8K introduction program & 8K game program.....\$9.95

**CONCENTRATION, HEAD-HUNTER, & MINDTAUR**

Hi-res graphics & adventure for family fun (2 8K programs) \$6.95

**OR**

**FREE with purchase of STAR TREX & FERZERX**

\* ALL ITEMS COME WITH 90 DAY GUARANTEE \*

G. R. JONES  
419 S. 105 E. PL.  
TULSA, OKLAHOMA 74128

1 PAK-MAN, SUPERFROG, ESCAPE!!! and 2 free APP's ALL 5 ONLY \$12.50  
shipped free

2 MS. PAK, FROGGY, POOSEBALL!! and 2 free APP's ALL 5 ONLY \$12.50  
shipped free

3 ANY 2 of mine and 3 APP's ONLY \$12.50 shipped free

4 SI-232 ONLY \$15.00 shipped free ONLY 3 LEFT

5 8K EXPANSION CARTRIDGES \$12.50 shipped free

6 AS IS IM-1's \$55.00 shipped free (Canadians add \$5. shipping)  
Include top, bottom, and J-connector

8 APP DIAGNOSTIC and free APP ONLY \$6.50

9 Any 1 of my games: Pek-Man, Superfrog, Escape, Ms. Pak, Froggy or  
Poosball for ONLY \$6.00 shipped free

I JUST RECEIVED A NEW SHIPMENT OF SOFTWARE, SO IF I WAS PREVIOUSLY  
OUT OF A GAME YOU ORDERED, IT'S IN NOW. PLEASE LIST ALTERNATES,  
THESE GAMES ARE GOING FAST.

10 7 APP's ONLY \$7.50 shipped free

11 12 APP's ONLY \$12.50 shipped free

ORDER FORM

Offer # Price

1 \$12.50  
2 \$12.50  
3 \$12.50  
4 \$15.00  
5 \$12.50  
6 \$55.00  
                  
8 \$ 6.50  
9 \$ 6.00  
10 \$ 7.50  
11 \$12.50

TOTAL \$

Make check payable to:

ERIC BECKETT  
8836 W. Waterford Sq. S.  
Greenfield, WI 53228

<input type="checkbox"/> ELECTRONIC FILES	<input type="checkbox"/> PERCEPTION
<input type="checkbox"/> BAR CHARTS	<input type="checkbox"/> MUSIC COMPOSER
<input type="checkbox"/> TYPING TUTOR	<input type="checkbox"/> SPACE DESTROYERS
<input type="checkbox"/> CHECK BOOK MANAGER	<input type="checkbox"/> HANGMAN
<input type="checkbox"/> BUDGET MANAGER	<input type="checkbox"/> SHOOTING GALLERY
<input type="checkbox"/> PERSONNEL BUS. MACH.	<input type="checkbox"/> CASINO
<input type="checkbox"/> BILLBOARD	<input type="checkbox"/> BLACK JACK
<input type="checkbox"/> SPACE, SIZE, SURFACE	<input type="checkbox"/> BASEBALL
<input type="checkbox"/> MATH TUTOR	<input type="checkbox"/> BOXING
<input type="checkbox"/> THE WORD FACTORY	<input type="checkbox"/> BACKGAMMON
<input type="checkbox"/> SPELLING QUEL	<input type="checkbox"/> CATENA
<input type="checkbox"/> JUMBLE UP THINGS	

Please list A for all alternates\*

PAK MAN       SUPERFROG       ESCAPE  
 MS. PAK       POOSEBALL       FROGGY

Canadian customers please  
include \$2. to help w/ship

**SPECIAL** Introductory offer from A-I-T the Advanced Interface Team.

**FLASH** GREAT NEWS FOR THE IM-1 OWNERS NOW AVAILABLE.

...A PARALLEL PORT FOR YOUR DM-1....A true extension into the world of interfacing....

AIT, the Advanced Interfacing Team, has just developed exclusively for the IM-1, the AIT-IMPIA parallel port card. Once the AIT-IMPIA is plugged into the IM-1 it's interfacing capabilities are limited only by your "IMAGINATION". Imagine sixteen parallel data lines and four control lines, from the power of Motorola's M6801 peripheral interface adapter, out to the end of a ribbon cable, and controlled by the Imagination Machine. With some imagination and a little skill it will be no time at all before you are turning lights on and off, monitoring room temperatures, running your model railroad, doing A/D and D/A conversions of all types. Whatever you might imagine, all under the software control of the IM-1, a powerful Motorola M6809 based microcomputer. COMING SOON.

If you have reservations about your hardware skills in interfacing with a parallel port, AIT has thought of you too. With the addition of our AIT-IMPLA-SI experimenter's attachment, you will in a short time learn the basic interfacing skills and technical finesse. The AIT-IMPLA-SI is a simple trainer board designed to help you learn how to use the AIT-IMPLA parallel port card. Lessons are included in the purchase price of the AIT-IMPLA-SI. Don't delay ORDER NOW.

\*Special introductory prices are good until April 30, 1984. Allow four to six weeks for delivery.

(Bear off here)

Qty.		Regular Price	Special Offer	Price extended
—	ALT-IMPIA..Parallel interface card with ribbon cable and technical data	\$24.95	79.95	\$_____
—	ALT-IMPIA-SI..Experimenters Training board with connector and training program.	49.95	14.95	_____*
Shipping and Handling +\$3.00 for each item ordered..... Pennsylvania Sales tax- Residents only..... Total... \$ _____				
Date	/ /			

Name: \_\_\_\_\_

1.1.8. *Conclusions*

ANSWER

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone(      )-\_\_\_\_\_-\_\_\_\_

**Amount of MONEY ORDER enclosed**

\*Sorry no C.O.D. or Personal Checks.

Money Order Formable top

### Advanced Interfacing Team

Mail order to: Advanced Interfacing Team  
2029 Margaret St.  
Philadelphia, PA. 19134

In the interest of helping the DM-1 owners with their hardware needs we are asking that you might take the time to respond to our questionnaire. This survey in no way obligates you to any purchases. It is strictly for our records and consideration for future items.

Are you interested in the following support hardware?

Yes 加

- Floppy Disk Interface Card FI-100 Connectable 10 Card Expansion card, replaces the SH-1 EPROM/PROM Turner Card.
- EPROM/ICM cartridges